

Comment on Conserving What? — The basis for nature conservation reserves in New South Wales 1967-1988

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The intellectual climate within Australia in which the first Conservation Survey was undertaken for the International Biological Program (IBP) was one that was very different from that pertaining today. Conservation was not seen by one's peers as a valid scientific exercise, and so was undertaken totally without funding — a tribute to the workers of whom there were many; for the concept of conservation of natural resources has been a philosophical ideal through Australia since the 19th Century.

I would like to outline some of the fundamental decisions which have influenced the development of conservation strategy in Australia over the last 40 years.

In 1960, Miss Minard F. Crommelin left a sum of \$7 000 to the Australian Academy of Science to establish an *Ecological Conservation Fund* to further the cause of conservation in Australia. A steering committee under the chairmanship of Dr Max Day fostered studies on the conservation status of each State/Territory in Australia (Aust. Acad. Science 1968).

The South Australian sub-committee included Prof. J. B. Cleland (a naturalist and conservationist of long experience), Dr Geoff Sharman (marsupial expert) and myself (plant ecologist). As much of South Australia has been covered by plant ecological surveys (see *The Vegetation in South Australia*. First Edition 1937; Second Edition 1972), it was decided to assess the conservation status of plant formations and associations within the state. The survey was published in *Trans. Roy. Soc. S. Aust.* (Specht and Cleland 1961). Although prepared at the same time as the first paper, it was two years later before a survey of the conservation status of all plant species recorded in South Australia was published (Specht and Cleland 1963).

Conservation of all living organisms was the target. It was reasoned that if all major plant communities (and associated abiotic habitat) in the state of South Australia were conserved (especially if the reserves are located near the central point of their distribution with or without replicate samples along their distributional range), most of the plant species would be conserved for posterity. Because all fauna are dependent either for food or shelter or both, most of the resident invertebrate and vertebrates would be included in these reserves. Special considerations would need to be made for the conservation of mobile vertebrates and invertebrates.

The emphasis was on the majority of the plant and animal species which are found in our major ecosystems, not on the minor number of rare and endangered species. As the distribution of major plant communities was reasonably known in South Australia (and elsewhere in Australia), and the distribution of vertebrates and invertebrates poorly known, it was decided to focus our conservation survey on major plant communities, rather than on ecosystems. Conservation could not wait until the animal ecologists caught up with the plant ecologists. And even today, animal ecology, because of its emphasis on population studies of single species, is still way behind the holistic approach of plant ecology.

This approach to the conservation of major plant communities in South Australia was followed by the Frankenberg Report (1971) for Victoria, sponsored by the Victorian National Parks Association (updated by Frood and Calder 1987). It became the basis for the Conservation Section of the International Biological Programme (1964-74) and was applied to the whole of Australia and Papua New Guinea in the Specht Report (1974).

One major problem with the method was the definition of major plant communities. Plant ecological surveys in Australia have been made haphazardly across the continent, often with markedly different degree of resolution depending on the nature of the survey, and with little attempt to co-ordinate the studies on a national basis. All the plant ecological literature in Australia has been collated by Marion Specht (1962) for *Bibliographia Phytosociologica Australia* and this index (updated) was available for the conservation survey of the International Biological Programme. Each State/Territory convener was provided with a list of plant communities recorded in the State/Territory. With a committee of ecologists and naturalists, the list was edited for the region; and integrated with the lists from the adjacent States/Territories. The list of major and minor plant communities produced by the committee formed the basis for the conservation survey in the State/Territory. The determination of gaps (deficiencies) in the conservation network was a major aim of the Survey (Specht et al. 1974).

The publication of the IBP Conservation Survey in 1974 stimulated some states to review the conservation

status of major plant communities after a decade had elapsed (Davies 1982 for South Australia; Forestry Commission of New South Wales 1981, 1989 for forests in New South Wales; Frood and Calder 1987 for Victoria; Sattler 1986 and Hynes 1990 for Queensland).

The committee-approach produced a list of major plant communities based on 50 years of field observations in the State Territory. Some of the units recognized were very broad in concept, others were sub-divisions of larger units. The broadly-defined plant communities were often only recognized by the dominant tree/shrub species of the overstorey, with little consideration of the contribution made by the many associated understorey plants. To overcome some of this difficulty, the same alliance was often recorded in a number of structural formations — e.g., *Eucalyptus marginata* (the jarrah of Western Australia) may be found as a dominant in an open-forest, a low open-forest, a woodland, or even in a shrubby heathland, with a gradient of changing understorey species. In areas where many ecological studies had been undertaken, the major plant communities had been subdivided into many minor communities which, then were seen to be as important as major communities.

After the somewhat subjective approach in devising the IBP list of major plant communities, it was essential to place the list of major plant communities on an objective basis. The lists of plant species recorded in almost 4 000 plant communities in over 1 500 ecological surveys throughout Australia have been collated into several large data-banks. These data-banks have been analysed by the polythetic-divisive classificatory programme TWINSPAN on the CSIRONET computer. Just over 400 Floristic Groups/Sub-groups have been defined by this technique for the whole continent of Australia. Probably another 50 Floristic Groups will be defined by TWINSPAN for the rainforest pocket of Northern Territory (Jeremy Russell-Smith), the rainforest pockets of south-east Queensland (Paul Forster), the wet sclerophyll forests and montane regions of southeastern Australia (Jamie Kirkpatrick). These objectively-defined Floristic Groups (Specht *et al.* in press) will form the baseline for the Conservation Survey of Australia, being tackled in 1990 supported by the Australian Heritage Commission and the Endangered Species Programme.

For a conservation reserve to be effective into the distant future, selection of a uniform stand of a single major plant community or ecosystem may be a recipe for disaster. Climatic change has occurred frequently in the past; it is now highly probable in the next 50-100 years due to the Greenhouse Effect. It is essential that all reserves contain a diversity of ecosystems to enable adjustment to any environmental change. Reserves should

be selected on the criteria of diversity, representativeness, naturalness and effectiveness (including size) as a conservation unit. *A Method for Selecting Nature Conservation Reserves*, based on these criteria, has been devised by Bolton and Specht (1983), supplemented by Purdie (1987).

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